

# Stroke Time Critical Care

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*Time Critical Diagnosis Stroke Chair*

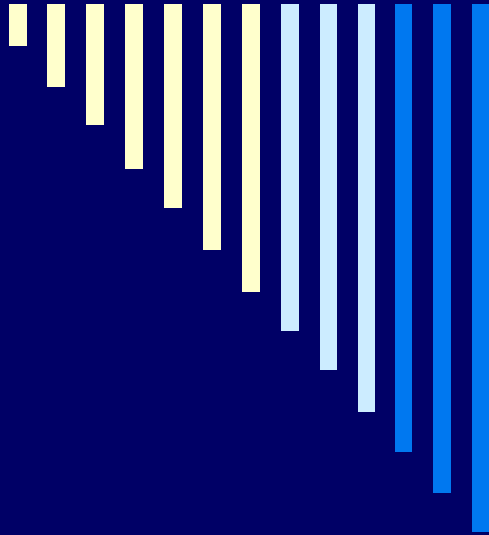
*CoxHealth Stroke Center*

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# Goals

- Illustrate Stroke as Abrupt Onset with Rapid Progression to Morbidity and Mortality
  - Conclude that STAT Treatment of Stroke is Required
  - Show that a Stroke System of Care is Necessary
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# The Terry Sbabo Story



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# Objectives

- ***Stroke Definition***
  - Acute Stroke Care
  - Impact of Stroke System Care
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# Stroke

- **Apoplexy** – sudden catastrophic event.
  - **Clinical syndrome** of neurological symptoms and signs that localize to a specific area of the brain.
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# Stroke: Two Types

## □ Types:

- **80% Ischemic:** Death of CNS tissue due to infarction that results from disruption of blood supply.
- **20% Hemorrhagic:** Rupture of abnormal blood vessel(s) with locally disrupted tissue structure and toxic effects of blood products leading to cell death.

□ Framingham Study

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# Ischemic Stroke



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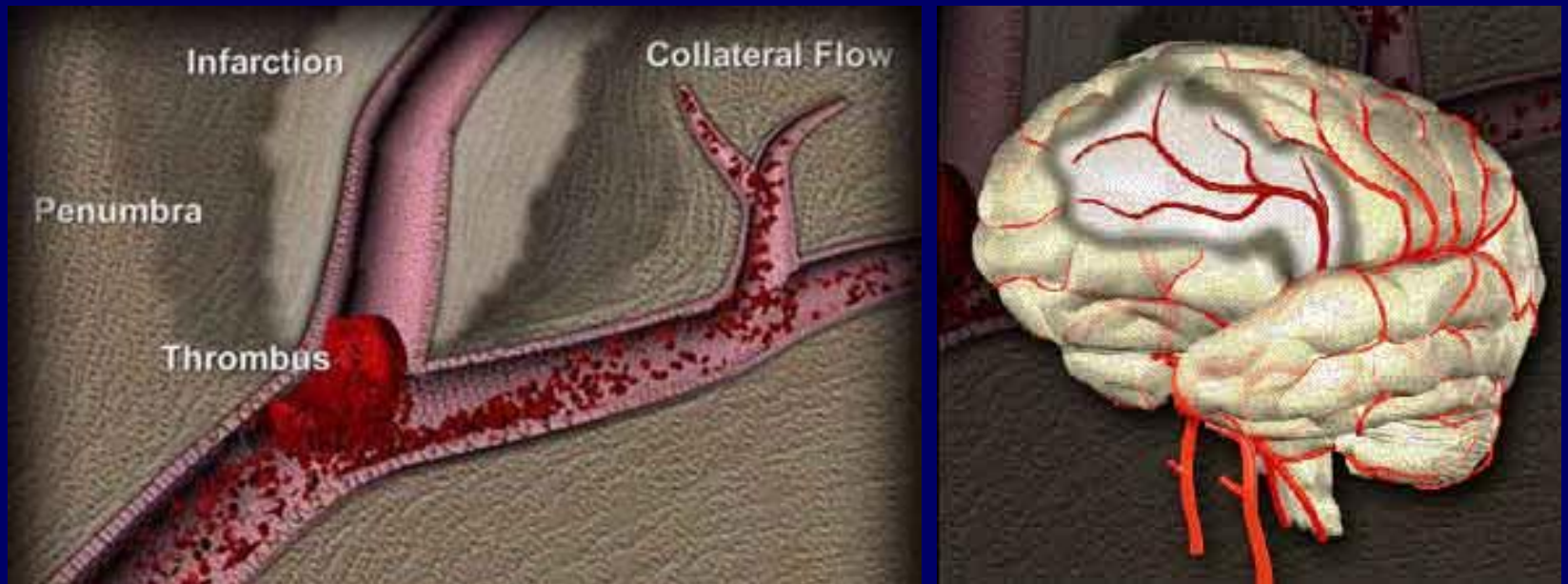


# How Fast Does Infarction Happen?

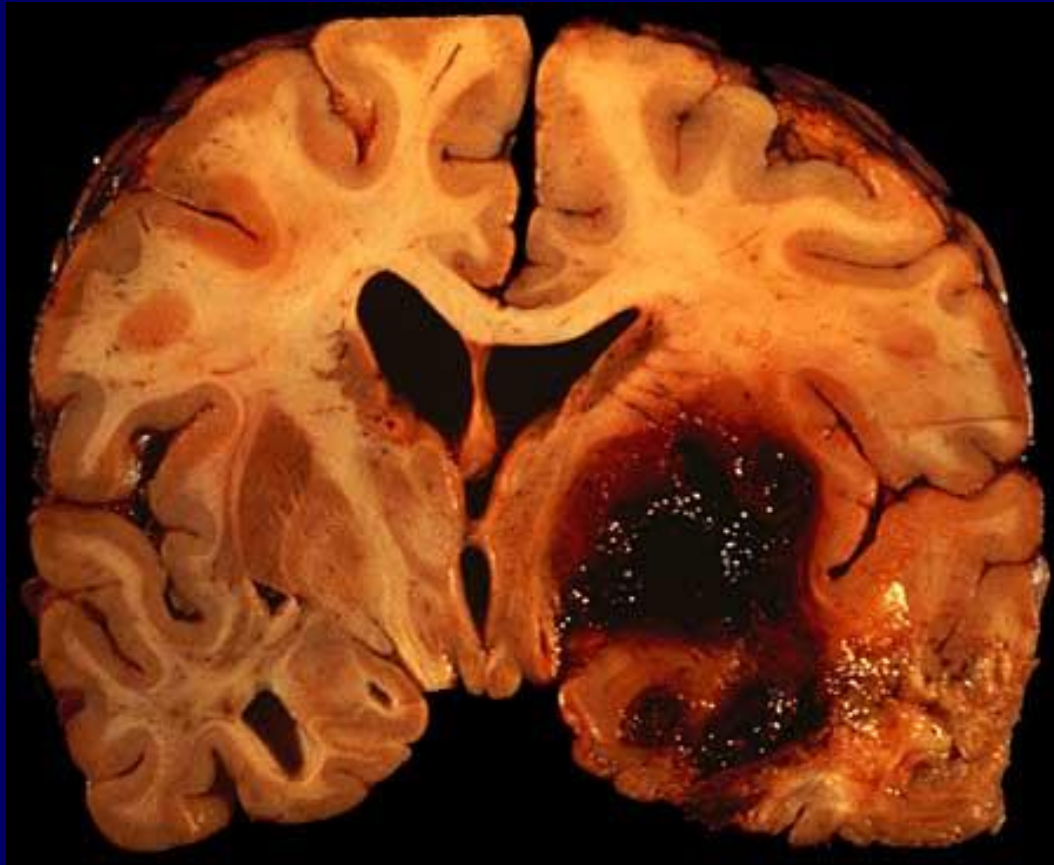
Most infarctions are completed in 3 hours

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# Ischemic Stroke: The Ischemic Penumbra



# Intracerebral Hemorrhage [ICH]



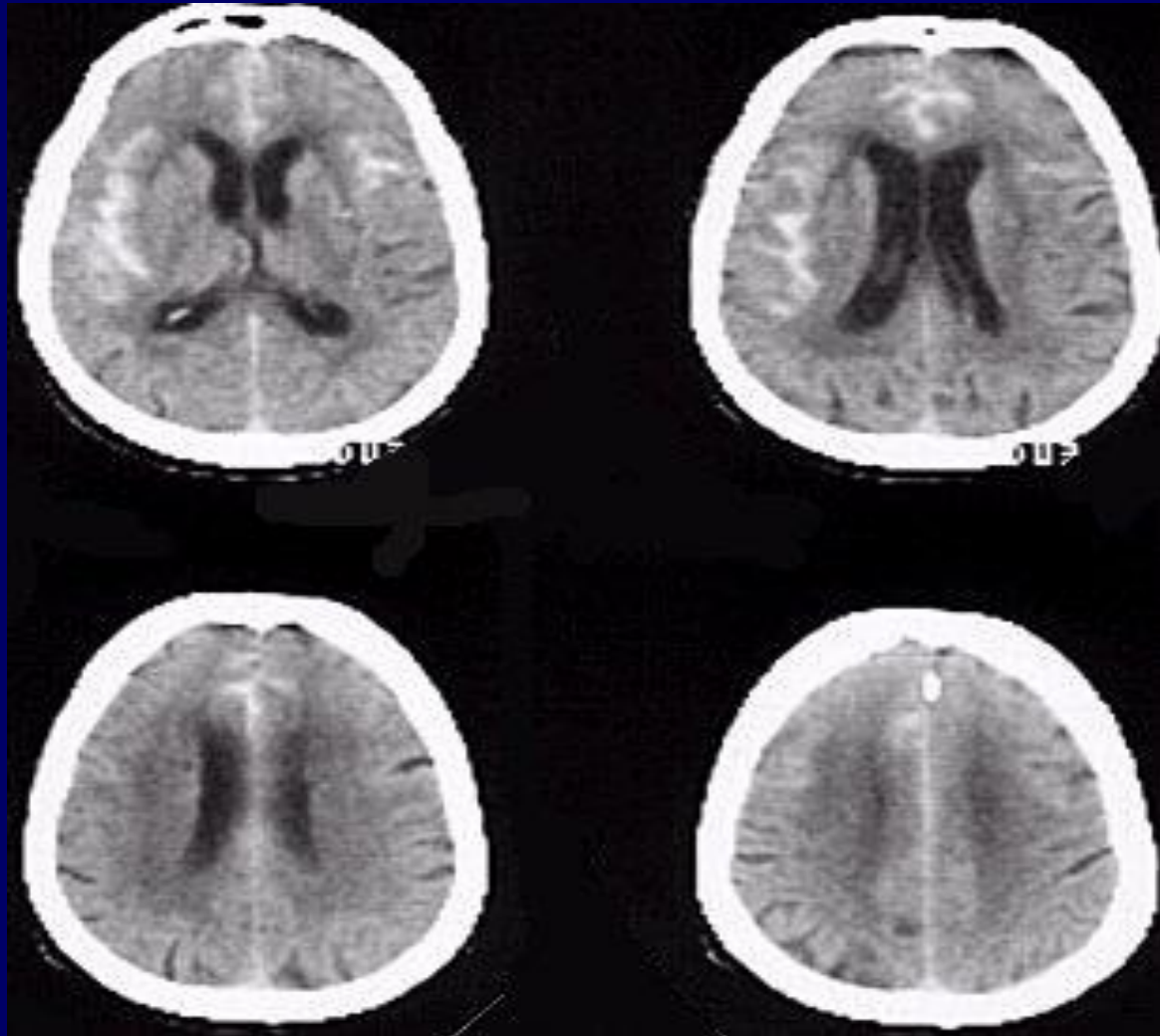


## How Fast does an ICH Deteriorate?

- ~30% of ICH progress within 1-3 hours after the initial bleed
- Progression is associated with morbidity and mortality
- Prognosis can be determined in first hours of hemorrhage based on volume, Glasgow Coma Scale

*Stroke*;38:2001-2023

# Subarachnoid Hemorrhage





# Deterioration in SAH

- Rebleeding is associated with 50% mortality
  - Complications of SAH occur immediately and hours after ictus
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# CONCLUSIONS

- Stroke: Sudden onset with time dependent progression.
  - Stroke is a Time Critical Diagnosis
  - To change natural history of stroke we need to treat stroke quickly.
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# Objectives

- Stroke Definition
  - ***Acute Stroke Care***
  - Impact of Stroke System Care
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# Acute Ischemic Stroke Care

- ACLS Protocol
  - Rapid Examination, Imaging, Laboratory, EKG
  - Rapid Reperfusion of Ischemic Brain
  - Rapid Control of Hyperglycemia, Temperature, Volume Status
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# Intracerebral Hemorrhage Care

- ACLS Protocol
- Rapid imaging and examination to identify prognosis
- Rapid Control of Blood Pressure, Hyperglycemia, Temperature
- Rapid Reversal of Coagulopathy
- Rapid Administration of rFactorVIIa
- Rapid Surgical Interventions

*Stroke* 2007;38:2001-2023



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# Subarachnoid Hemorrhage Care

- ACLS Protocol
  - Rapid Laboratory, Imaging and/or Lumbar Puncture
  - Rapid Control of Blood Pressure
  - Rapid Angiography
  - Rapid Definitive Aneurysm Treatment
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# CONSENSUS

- Take care of Stroke STAT to reduce morbidity and mortality

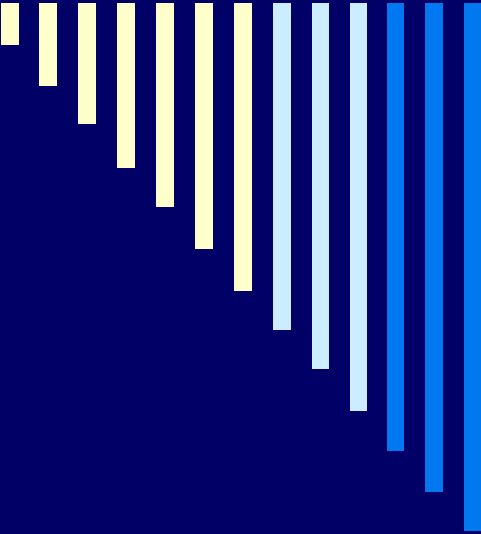


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# Objectives

- Stroke Definition
  - Acute Stroke Care
  - ***Impact of a Stroke System***
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# Acute Ischemic Stroke System Care

**ALS is the most common stroke  
syndrome in Missouri**

**-Medicare Data**

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# Ischemic Stroke Care Underutilization

- Why do only ~2% of AIS patients receive acute therapy?
    - Therapy not considered
    - Public Awareness of signs and symptoms, consequences.
    - Too late to needle:
      - Symptom/Sign Recognition
      - Transportation to AIS –ready Hospital delayed
      - Protocols not in place
      - Personnel and resources not “Time Critically” prepared
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## Why are eligible thrombolysis candidates left untreated?

*American Journal of Preventive Medicine. 31(6 Suppl 2):S210-6, 2006 Dec.*

Hills NK. Johnston SC.

Department of Neurology, University of California,  
San Francisco 94143-0114, USA.

**COHORT:** All patients with an initial diagnosis of ischemic stroke arriving within 2.5 hours of symptom onset at 11 hospitals participating in the Centers for Disease Control and Prevention-sponsored California Acute Stroke Prototype Registry during two 3-month periods in 2002 and 2003.

**CONCLUSIONS:** later hospital arrival is associated with nontreatment with thrombolytics.

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## ASA Task Force Statement:

“ obstacles [to care] can be related to a fragmentation of stroke-related care caused by inadequate integration of facilities, agencies and professionals that should closely collaborate in providing stroke care”

***Stroke*** 2005;36:690-703

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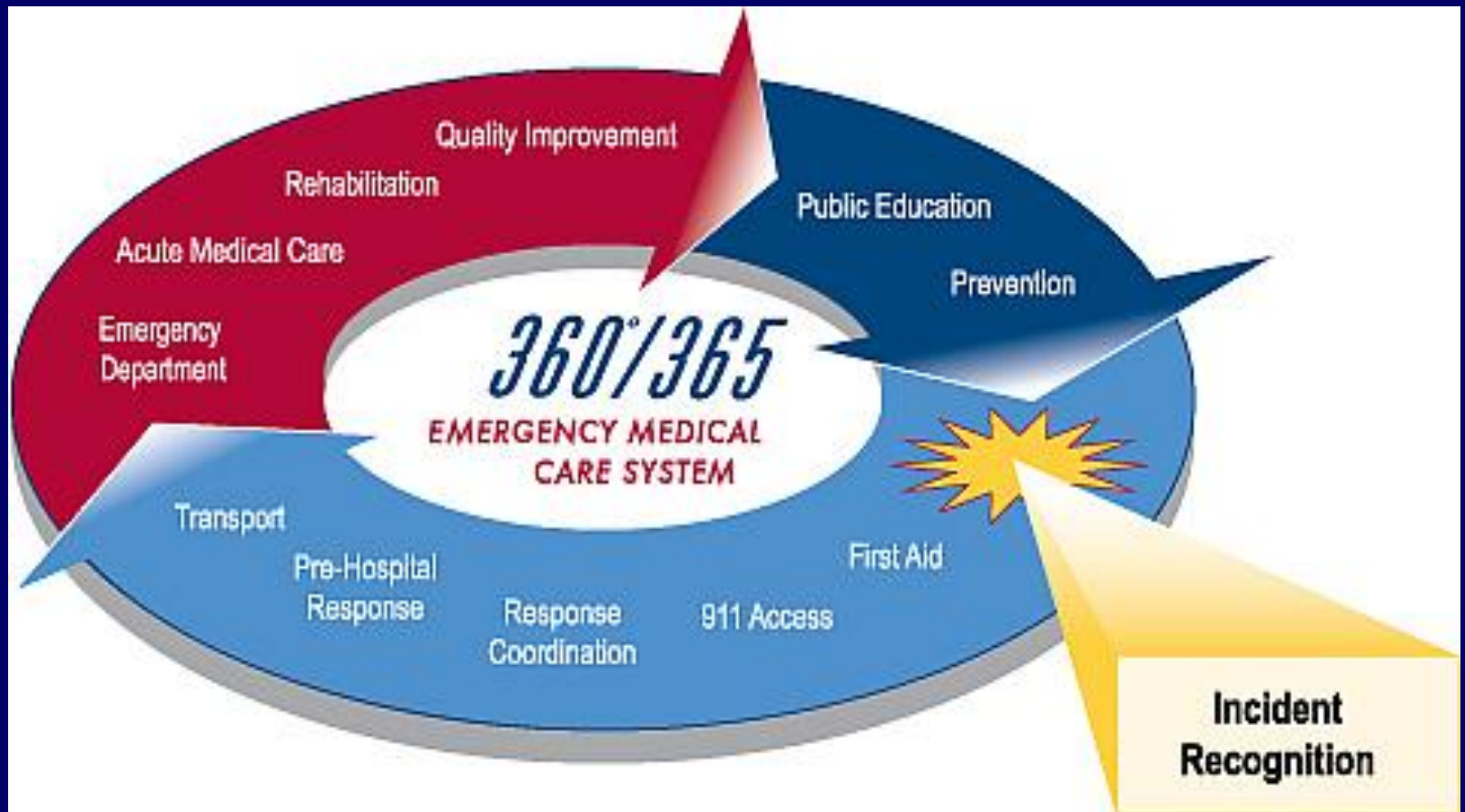


# How Do We Rapidly Treat Stroke?

## □ Coordination of Care:

- Public's Recognition of Symptoms
  - Activate 9-1-1
  - Transport to Nearest Stroke Ready Facility
  - Emergency Stroke Care
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# Stroke: Time Critical Diagnosis





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# Stroke System Care in Missouri:

Kansas City – Mid America Brain and Stroke Institute  
Springfield - CoxHealth and St Johns Stroke Centers

## □ Regional Stroke Center

- Public Awareness of Symptoms
  - EMS transportation to nearest facility
  - Hospital Stroke Ready
  - Transfer to Regional Care Center
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# Are Hospitals Ready ?

- 68% of Hospitals in Missouri are willing to treat AIS
    - 2005 MDHSS Stroke Survey
  - 1.5% of all stroke patients get AIS treatment in Missouri
    - Medicare AIS Data
  - **CONCLUSION:** We need a system to increase the overall number of patients who receive acute therapy.
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# Is This Financially Responsible?

- ❑ Multiple economic model based papers support the direct and indirect **benefits** of stroke treatment.
  - ❑ Most Large and Medium sized Hospitals **are Stroke Ready**
  - ❑ Hospitals now receive **added reimbursement** for stroke patients who get thrombolysis.
  - ❑ **Save** on travel expenses and limit accident exposure of the EMS.
  - ❑ **Failure to treat** is the legal precedence.
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